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Review

Establishing perennial grass energy crops in the UK: A review of current propagation options for *Miscanthus*

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Abstract

A key UK government strategy is to expand the supply of home grown biomass and facilitate the development and competitiveness of a sustainable supply chain, while promoting low-carbon technology. Analysis of the potential supply chain suggests that this can, in part, be achieved by growing energy crops. Meeting expectations is, however, reliant on developing an economically viable biomass sector which incorporates efficient, sustainable and regional supply chains to increase biomass use.

This review aims to present the knowledge by which plant propagules, for the biomass supply chain, can be produced at minimum cost. It specifically addresses the potential of biomass production from the perennial grass *Miscanthus*. This review is part of a

project to identify the causes for the apparent limitations in the establishment of UK perennial energy crops. The work reported here focuses on the knowledge available regarding the potential routes by which *Miscanthus* material could be mass produced.

The review concludes that high density plantings must be established to maximise yields. Vegetative clonal plant propagation is required to deliver uniform crops of selected germplasm. Commercial seed production in the UK is not possible and potentially undesirable for selected germplasm. Rhizome production and division is slow, but currently does not limit increases in production because the UK industry uptake is currently small. Uptake of new germplasm will be dependent on the use of rapid and cost effective plant propagation systems, particularly vegetative systems. The germplasm collection established provides an opportunity for genotypes to be propagated by a range of techniques to determine ease of propagation in terms of cost and multiplication rates. At present the establishment rate of *Miscanthus* is slow and this appears limited by economics; evidence suggests that the cost of plant propagules is one factor that constrains widespread planting. New techniques are required that simultaneously reduce unit costs of propagules and increase the speed of their availability to aid this developing industry.



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Keywords

Bioenergy; Biomass; Micro-propagation; *Miscanthus*; Nodal cuttings; Vegetative propagation; Seed; Stem cuttings

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